Abstract

A regulation method for decision tree construction is described wherein decision rules can be automatically adjusted between crisp and soft decisions. Starting with a conventional decision tree, additional statistics are stored at the terminal and non-terminal nodes during training and used during application to new samples. The regulation process allows automatic determination of tree structure. It also allows incremental updating of a regulation decision tree with graceful change to classification performance characteristics. Compound regulation decision trees are described for use to update the decision structure when new training input samples include new classes. Methods for pruning regulation decision trees, for focusing regulation decision trees, for determining optimal depth and regulation parameters and for determining optimal sample weighting are taught.